

**The Effect of Parental Worries on Adolescent Cannabis use:  
Examining the Moderating Effect of Adolescents' Self-efficacy.**

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**Abstract (Dutch)**

Bezorgde ouders hebben moeite met het vertalen van hun zorgen in gedrag. Het hebben van zorgen weerhoudt ouders ervan om effectief op te treden. Dit is een belangrijke indicator voor de maandelijkse prevalentie van het cannabis gebruik van de adolescent. Ondanks deze bevindingen is er tot heden geen onderzoek gedaan naar de invloed van ouderlijke zorgen op het cannabis gebruik van de adolescent. In deze studie zal de invloed van ouderlijke zorgen op het cannabisgebruik van de adolescent nader worden bekeken. Daarnaast zal er worden gekeken of dit effect verschilt voor adolescenten met een hoge of lage zelfeffectiviteit. De data is verkregen uit de *'Preventie Alcoholgebruik Scholieren'* dataset. In totaal zijn 359 ouder-kind relaties geschikt gevonden voor analyse. Voor de analyse is gebruik gemaakt van een logistische regressie. Uit de resultaten is gebleken dat er geen significant effect van ouderlijke zorgen op het cannabis gebruik van de adolescent is. Ook is er geen significant interactie-effect gevonden. Hieruit volgend kan worden geconcludeerd dat het effect van ouderlijke zorgen op de maandelijkse prevalentie van cannabis gebruik van de adolescent niet verschilt voor adolescenten met een lage of hoge zelf-effectiviteit.

*Keywords:* ouderlijke zorgen, cannabis gebruik, zelfeffectiviteit, adolescent

**Abstract (English)**

It is pretty common for parents to worry about their child now and then. Parents often have problems translating their worries into behavior which hinders parents from acting effectively. This may be relevant for the use of cannabis of the adolescent. Yet, no research is available about the impact of parental worries on the cannabis use of the adolescent. In this study the influence of parental worries on the prevalence of cannabis use of the adolescent will therefore be examined. Additionally, the study examines whether this relationship differs for adolescents with a high or low self-efficacy. The data were derived from the longitudinal

*Prevention of Alcohol Use in Students (PAS)* dataset. A total of 359 parent-child dyads were included. The results of the logistic regression analysis showed no support for the main effects. Parental worries did not have a significant effect on the cannabis use of the adolescent. Furthermore, no interaction effects were found. Following this, it can be concluded that the relationship between parental worries and the prevalence of cannabis use of the adolescents does not differ for adolescents with a high or low self-efficacy.

*Keywords:* parental worries, cannabis use, self-efficacy, adolescent

## **The Effect of Parental Worries on Adolescent Cannabis use: Examining the Moderating Effect of Adolescents' Self-Efficacy.**

During the developmental phase of adolescence, risky behaviors such as the use of alcohol and drugs start emerging (Van Zalk et al., 2018). The most widely used drug among adolescents around the world is cannabis (Europees Waarnemingscentrum voor drugs en drugsverslaving, 2013). The use of cannabis among Dutch adolescents is higher than in most other European countries and is associated with several health and psychosocial problems (Dupont et al., 2017; Hall, 2014). These include low educational performance, cognitive and respiratory impairment and psychotic disorders (Dupont et al., 2017; Hall, 2014; Van Ours & Williams, 2011). Furthermore, when adolescents start experimenting with cannabis at an early age, they are at an increased risk of becoming dependent on drugs later in life (Bogensneider et al., 1998; Booth & Anthony, 2014). These adverse outcomes underline the need to identify factors that influence the early use of cannabis among adolescents. Several studies have shown that parents play an imperative role in adolescents' development in general, and use of substances in specific (Baumrind, 1991; Calafat et al., 2014; Carver et al., 2017; Luthar & Goldstein, 2008). One of the factors that may have an impact on adolescents' cannabis use is the amount of worries parents have about their children.

Worries are a chain of negative thoughts and images and are initiated by an environmental and/or imaginal fear stimulus (Borkovec et al., 1983). The increase in risk-taking behaviors during adolescence, and particularly the risk of using drugs, often make parents worry about the behavior of their child (Sturm et al., 2008; Van Zalk et al., 2018).

This can be explained by two cognitive processes, threat appraisal and coping appraisal, as described in the protection motivation theory (Webb et al., 2010; Yan et al., 2014). In the threat appraisal, perceived intrinsic and extrinsic rewards of a maladaptive health-related behavior are compared to perceived threats of the behavior. In the coping

appraisal, the coping efficacy to adapt to a health-related behavior is compared to the perceived response costs of the adaptive behavior (Thrul et al., 2013). Thus, the threat appraisal examines the perceived seriousness of the situation and the coping appraisal refers to how someone responds to the situation. The balance between the threat appraisal and the coping appraisal determines the likelihood that an adaptive response will occur (Brouwers & Sorrentino, 1993). Parents who experienced earlier risk behaviors of their child, such as the use of alcohol, are more emotionally involved in the threat appraisal process and are more likely to worry about adolescents' involvement in other risk behaviors such as the use of cannabis (Koning et al., 2013; Sturm et al., 2008; Van Zalk et al., 2018).

Furthermore, when parents do not feel capable enough to influence the risk behavior of the adolescent, they experience higher levels of worries. Worried parents often have problems translating their worries into behavior which hinders parents from acting effectively (Booth & Anthony, 2014; Maloney et al., 2011; Roser & Thompson, 1995). This is in line with the research of Koning et al. (2013), in which evidence has been found that parents who worry more about their child are more likely to be involved in ineffective parenting practices in relation to alcohol use which subsequently predicted more alcohol use in the adolescent (Koning et al., 2013). Following this and other research that has demonstrated that parental worries also relate to less monitoring of adolescents' whereabouts, which is also an important predictor of cannabis use (Kerr et al., 2008; Murphy et al., 2012; Nash et al., 2005), it is likely that parental worries are also relevant for adolescents' cannabis use. Yet, to our knowledge, no research is available about the impact of parental worries on the cannabis use of the adolescent.

One factor that may influence the influence of parental worries on adolescents' cannabis use is the level of adolescents' self-efficacy. Self-efficacy refers to one's beliefs in his or her capacity to influence the outcome of a given situation through one's own actions

(Bandura, 1977). It includes feeling confident in one's skillfulness and feeling able to use those skills and perform the coping action (Bandura, 1997). Although self-efficacy has been found to be directly related to cannabis use among adolescents (Connor et al., 2014; Newton et al., 2011), not enough attention has been paid to whether higher self-efficacy can act as a moderator to change the effect of influencing factors on cannabis use among adolescents (Golestan & Abdullah, 2015). Self-efficacy has been found to moderate the effect of different parenting behaviors and their influence on the adolescents' substance related behavior. Research of Hedzir et al. (2019) showed that self-efficacy moderates the relationship between parental monitoring and drug use among adolescents. The relationship between parental monitoring and substance use was stronger for adolescents with a low self-efficacy, indicating that adolescents with a lower self-efficacy were more likely to use substances due to a lower level of monitoring. Another study showed the moderating effect of self-efficacy on the relationship between parents' smoking and adolescents' smoking (Golestan & Abdullah, 2015). A lower self-efficacy predicted a higher probability of smoking by the adolescent if the parent was also a smoker. Research has also shown that individuals with a higher self-efficacy are less susceptible to worries and more likely to improve negative aspects of their social environment (Hiller & Hambrick, 2005; Piquart et al., 2004). Based on these findings it is therefore expected that the relationship between parental worries and adolescent cannabis use will be weakest for adolescents with a high self-efficacy and strongest for adolescents with a low self-efficacy.

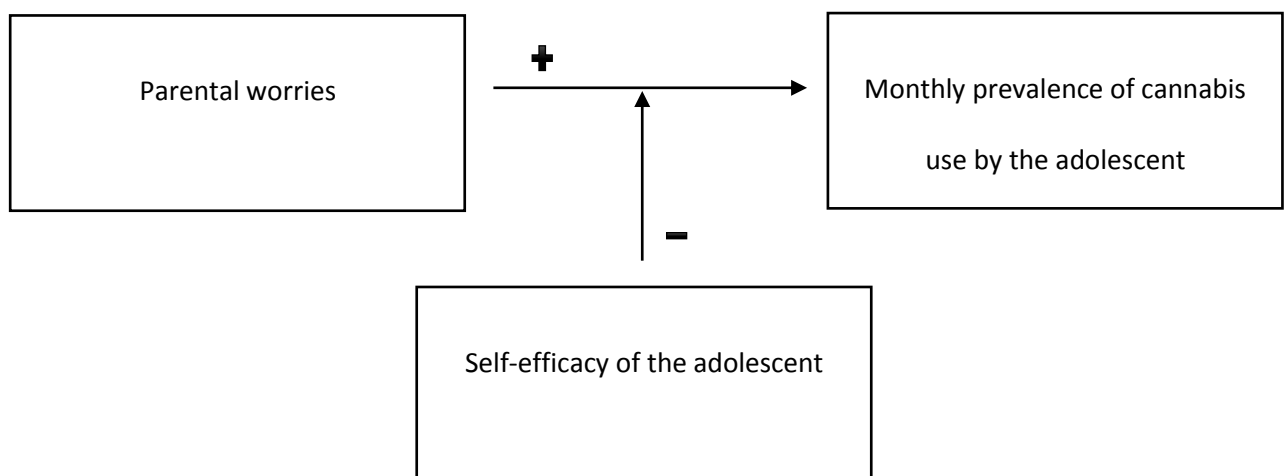
### **The Current Study**

The aim of the current study is to examine the relationship between parental worries and adolescents' cannabis use and the extent to which this is moderated by the self-efficacy of the adolescent. To investigate this relationship, a longitudinal design including adolescents between thirteen and seventeen years old was applied.

Based on previous research it is expected that more parental worries influence the prevalence of cannabis use by the adolescent. It is assumed that more parental worries will lead to a higher likelihood of having used cannabis among adolescents (H1). Also, it is expected that the self-efficacy of the adolescent will moderate this relationship. It is expected that the relationship between parental worries and adolescent cannabis use is strongest for adolescent with a low self-efficacy and weakest for adolescent with a high self-efficacy (H2). The research model of this study is shown in Figure 1.

**Figure 1.**

*Research Model of the Association Between Parental Worries and Adolescents' Cannabis Use and the Moderation Effect of Self-Efficacy of the Adolescent.*



## Method

### Design and Procedure

The data used in the current study is retrieved from the *Prevention of Alcohol Use in Students* (PAS) study (Koning et al., 2009). A total of eighty secondary schools in the Netherlands were randomly selected and invited to participate in the PAS study. From those eighty schools, nineteen schools participated and were randomly assigned to one of the three experimental conditions or control condition. Both adolescents and their parents participated in the study. Between 2006 and 2009 four measurements were done to collect the data.

To collect the data, adolescents were provided with a digital questionnaire in the classroom under supervision of a research assistant. The parental data was gathered by written questionnaires which were sent to their home simultaneously with a letter of consent. The letter of consent gave parents the possibility to refuse participation of the adolescent. In total there was a 0.01% refusal rate (Koning et al., 2009). The questionnaires could be filled in by either the mother or the father. Parents who had not responded three weeks after receiving the questionnaire received a reminder. Parents who did not respond until then, subsequently received a call two weeks after the first reminder.

As the original study was an intervention trial, only adolescents and parents in the control condition who participated in the third (T3) and fourth wave (T4) have been used, further referred to as T1 and T2 respectively. In the last two waves, adolescents are more likely to have used cannabis because they are older. The control group is selected to make sure that the outcomes will not be effected by the effects of the intervention.

### Participants

A total of 906 participants were included in the control group at T1. The mean age in the adolescent sample at T1 was 14.2 ( $SD=.50$ ), including 57.1% boys. Of the adolescents who participated at T1, 94.8% also participated at T2. The sample for parents included mainly



female respondents (84.4%). One third of the fathers (34.3%) and one third of the mothers (31.5%) had a low educational level.

In order to compare the participating adolescents and the non-participating adolescents at T2, an attrition analysis was conducted. No significant differences at T1 were found for gender ( $t(800) = 1.251, p > .05$ ), age ( $t(800) = .611, p > .05$ ), self-efficacy ( $t(799) = -.778, p > .05$ ) or the use of cannabis ( $t(800) = -.604, p > .05$ ) between participating and non-participating adolescents at T2. An attrition analysis was also conducted for parents in order to compare the participating and non-participating parents at T2 for T1 variables. For parents no significant differences were found for worries ( $t(530) = .147, p > .05$ ) or gender of the parent ( $t(141.45) = -1.284, p > .05$ ).

Due to non-response at T2 of the adolescent (N=47) and parents (N=299) and incomplete data for parents (N=248) and adolescents (N=134), 359 parent-child dyads could be included for analysis.

## Measures

### *Monthly Prevalence of Cannabis Use by the Adolescent.*

The monthly prevalence of cannabis use by the adolescent was measured at T1 and T2 by asking how many times the adolescent had used cannabis in the last four weeks (Verdurmen et al., 2005). The answer scale consisted of a fourteen-point Likert scale (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11-19, 20-39 and 40 times or more). Due to the skewed distribution, the variable was dichotomized into 0= *never used* and 1= *used cannabis once or more*.

### *Parental Worries.*

Parental worries were measured at T1 and reflected worries of parents about different adolescent behaviors, such as *the use of drugs; not completing school; coming in contact with the police; hanging around with bad peers and the use of alcohol*. Answer categories ranged

from *never* (1) to *very often* (5). The mean score of the items describes the level of parental worries at T1. A higher score indicates more parental worries. The reliability was  $\alpha = .84$ .

### ***Self-efficacy of the Adolescent.***

The self-efficacy of the adolescent assesses the level of confidence the adolescent has in one's own ability (Bandura, 1977). The variable has been measured at T1. Thirteen items were included to measure the self-efficacy of the adolescent. Examples of such statements were; *I am good at resisting temptations; I refuse things that are bad for me; I can work well towards goals that are far in the future.* Answer categories ranged from *never* (1) to *very often* (5). This allowed the students to indicate to what extent the statement applied to themselves. Nine items were recoded to make sure all the statements were in the same direction. The mean score of the items describes the level of self-efficacy at T1. A higher score indicates a higher self-efficacy of the adolescent at T1. The reliability was  $\alpha = .79$ .

### ***Gender of the Adolescent.***

Several studies found differences in drug use between male and female adolescents (Haas, 2004; Kulis et al., 2003; Wallace et al., 2003). Therefore, gender was included as a control variable (0= *boys*, 1=*girls*).

## **Analyses**

In the current study, IBM SPSS statistics Version 25 was used to analyze the data. Descriptive analyses were conducted for the demographic variables of both the adolescents and the parents. Following this, a spearman correlation was executed to detect possible correlations between variables included in the current study. To analyze the effect of parental worries at T1 on adolescents' monthly prevalence of cannabis use at T2, a logistic regression was conducted.

Gender of the adolescent and the monthly prevalence of cannabis use at T1 were included as control variables. In the first model, the control variables at T1 were included. In

the second model the independent variable parental worries was included. To test the moderating effect of self-efficacy with parental worries, the interaction variable and the moderator were included in the third model. Both the independent and the moderating variables were standardized before the interaction variable was computed. Effects were considered significant when the  $p$  value was lower than .05.

## Results

### Descriptive Analyses

The descriptive statistics for both female and male adolescents are shown in Table 1. A notable result was the low prevalence of cannabis use in the last month by the adolescents at both T1 (3.1%) and T2 (8.9%). The self-efficacy of the adolescents was relatively high ( $M = 3.48$ ,  $SD = .58$ ). Furthermore, the descriptive statistics of the adolescents showed that cannabis use was highest among male adolescents at both T1 (3.9%) and T2 (12.2%). The differences in cannabis use among female and male adolescents were not significant at T1 ( $t(357) = 1.062$ ,  $p > .05$ ). However, at T2 significant differences were found for female and male adolescent's cannabis use ( $t(348.39) = 2.69$ ,  $p = .007$ ). The descriptive statistics of parents, separated for gender, are presented in Table 2. Noteworthy in Table 2 is the gender distribution of the participating parents. A majority of the participating parents were women (84.4%).

**Table 1.**

*Descriptive Statistics of all Variables of Interest for the Adolescent Sample and Across Adolescents' Gender (N=359).*

	Female adolescent (42.9%)	Male adolescent (57.1%)	Total (N= 359)
Age, mean (SD)	14.05 (.42)	14.12 (.50)	14.09 (.47)
Cannabis use T1, percentage users	1.9	3.9	3.1
Cannabis use T2, percentage users	4.5	12.2	8.9
Self- efficacy, mean (SD)	3.50 (.59)	3.46 (.57)	3.48 (.58)

*Note.* SD = standard deviation.

**Table 2.**

*Descriptive Statistics of all Variables of Interest for the Parent sample and Across Parents'*

*Gender (N= 359).*

	Mother (84.4%)	Father (15.6%)	Total (N= 359)
Parental worries T1, <i>mean (SD)</i>	1.83 (.59)	1.69 (.53)	1.81 (.58)
Education, percentage lower	31.50	34.30	65.74

*Note. SD = standard deviation.*

### **Correlations**

The results of the spearman correlation analysis are presented in Table 3. A notable result is that there was a significant and positive correlation between parental worries at T1 and the monthly prevalence of cannabis use of the adolescent at T1 ( $R_s = .18, p < .01$ ) but not at T2 ( $R_s = .10, p = .06$ ). Additionally, parental worries at T1 were negatively correlated with the gender of the adolescent ( $R_s = -.14, p < .01$ ) indicating that higher levels of parental worries were found for male adolescents in comparison to female adolescents. Another notable result is that the self-efficacy of the adolescent at T1 negatively correlated with the cannabis use of the adolescent at T1 ( $R_s = -.15, p < .01$ ) as well as at T2 ( $R_s = -.24, p < .01$ ). This indicates that a lower self-efficacy of the adolescent was related to more cannabis use by the adolescent. The self-efficacy of the adolescent also negatively correlated with parental worries at T1 ( $R_s = -.25, p < .01$ ).

**Table 3.**

*Spearman Correlation Matrix of Demographic Variables, the Cannabis Use of the Adolescent, Parental Worries and the Self-efficacy of the Adolescent, N=359.*

Variable	1	2	3	4	5	6	7	8	9
1. Age	-								
2. Gender adolescent	-.06	-							
3. Cannabis use T1	.08	-.06	-						
4. Education mother	-.08	-.04	-.02	-					
5. Education father	-.14**	.01	.02	.49**	-				
6. Gender parent	.03	.00	-.06	-.01	-.18**	-			
7. Cannabis use T2	-.03	.13*	.12*	-.02	-.02	.05	-		
8. Parental worries T1	-.01	-.14**	.18**	-.00	-.09	.08	.10	-	
9. Self-efficacy T1	-.06	.06	-.15**	.10	.07	-.01	-.24**	-.25**	-

\* $p < .05$ . \*\* $p < .01$ .

### The Influence of Parental Worries on the Cannabis Use of the Adolescent

A logistic regression testing the direct effect of parental worries at T1 on the cannabis use of the adolescent at T2, while controlling for gender and cannabis use at T1, are shown in Table 4. The results show that there was no significant effect of parental worries at T1 on the cannabis use of the adolescent at T2 ( $OR = 1.31$ ,  $CI = .60, 2.85$ ,  $p = .50$ ). This indicates that parental worries at T1 were not predictive of the prevalence of cannabis use by the adolescent one year later. Gender of the adolescent was a significant predictor of the cannabis use of the adolescent at T2 ( $OR = .35$ ,  $CI = .14, .88$ ,  $p < .05$ ), indicating that being a female adolescent decreased the odds of using cannabis at T2.

### Moderation by Self-efficacy of the Adolescent

To assess whether the relationship between parental worries at T1 and monthly prevalence of cannabis use of the adolescent at T2 is moderated by adolescents' self-efficacy

at T1, the interaction term was added to the model. No significant interaction effect between parental worries and the self-efficacy of the adolescent was found ( $OR = 1.32$ ,  $CI = .89, 1.97$ ,  $p = .17$ ) This indicates that the influence of parental worries on the cannabis use of the adolescent did not differ for the level of self-efficacy of the adolescent.

**Table 4.**

*Logistic Regression Analysis of the Influence of Parental Worries on the Cannabis Use of the Adolescent (N=359).*

	OR	95% CI OR		p
		<i>Lower</i>	<i>Upper</i>	
Gender				
Male (ref)				
Female	.35	.14	.88	.03*
Cannabis use T1	2.26	.42	12.18	.34
Parental worries T1	1.31	.60	2.85	.50

*Note.*  $OR$  = odds ratio;  $CI$  = confidence interval.

\* $p < .05$ .

## **Discussion**

The current study assessed the influence of parental worries on the monthly prevalence of cannabis use among adolescents and whether this relationship was moderated by the self-efficacy of the adolescent. No influences for parental worries on the monthly prevalence of cannabis use by the adolescent were found. Furthermore, no moderation effect was found for the self-efficacy of the adolescent.

### **Influence of Parental Worries**

The current study shows that parental worries do not seem to influence the monthly prevalence of cannabis use by the adolescent. This indicates that, contrary to our hypothesis, a higher rate of parental worries does not lead to a higher monthly prevalence of cannabis use by the adolescent. This was not expected based on the study of Koning et al. (2013), in which an effect of parental worries on the alcohol use of the adolescent has been found. A possible explanation for the lack of effect in the current study, is the low prevalence rate of cannabis use among younger adolescents such as the adolescents in the current study. Younger adolescents are less likely to have ever tried cannabis in comparison to older adolescents (Degenhardt et al., 2000; Van Dorsselaer, Tuithof, Verdurmen et al., 2016; Korf, 2006; Le Strat et al., 2015). Furthermore, the increase in cannabis use is also relatively low among adolescents (Van Dorsselaer, Tuithof, Verdurmen, et al., 2016). The same effect has been found for adolescents in the current sample. Of the 359 adolescents, only 33 adolescents used cannabis at T2. The prevalence rate of alcohol use and the increase in alcohol use among younger adolescents, is in comparison to cannabis use much higher (Van Dorsselaer, Tuithof, Verdurmen, et al., 2016; Patton et al., 2007). It is therefore likely that the sample of adolescents who used alcohol in the study of Koning et al. (2013) was relatively higher than the sample of adolescents who used cannabis in the current study. A small sample decreases the predictive power of the study. As the current sample of adolescent who used cannabis is



very small, it is likely that the predictive power in the current study was low as well. This means that certain effects for parental worries may have been underestimated or undetected but may still be present. Since younger adolescents are less likely to have ever tried cannabis in comparison to older adolescents it would be interesting to investigate whether parental worries do influence the cannabis use among older adolescents, when the prevalence rate is higher.

Furthermore, research has shown that lower levels of worries can be adaptive, whereas higher levels of worries often lead to poor functioning (Dugas et al., 2004; Korte et al., 2016). That is, evidence has been found that parents who worry about the young adolescent are more likely to seek out for support or help to become more knowledgeable about the whereabouts and activities of the adolescent (Pettit et al., 2007). Also, research has shown that parents' 'gut-level' reactions to the problems of the adolescent, is related to parents' reports of their active monitoring behaviors. The 'gut-level' of parents exists of reported worries and the lack of trust they feel towards the adolescent (Kerr & Stattin, 2003, Chapter 9; Pettit et al., 2007). Parental monitoring in turn is a protective factor for the use of substances like cannabis (Deutsch et al., 2012; Hoeve et al., 2009). However, when parents feel less capable of influencing the risk behavior of the adolescent, this leads to higher levels of parental worries. Higher levels of worries in turn hinder parents from acting effectively (Booth & Anthony, 2014; Koning et al., 2013; Maloney et al., 2011; Roser & Thompson, 1995). In the study of Van Dorsselaer, Tuithof and Monshouwer (2016) it has been found that a majority of parents feel capable of influencing the cannabis use of the adolescent whereas less parents feel capable of influencing the alcohol use of the adolescent. It is therefore likely that the worries parents have increase when the adolescent is using alcohol, this in contrast to cannabis use, which hinders parents from acting effectively.

If worries are related to the problem behavior of the adolescent such as the use of alcohol or cannabis, seems to depend on what parents do with these worries. It can therefore be that parental worries do not have a direct effect but an indirect effect through parenting practices such as parental monitoring.

### **Moderation by Self-Efficacy of the Adolescent**

No significant moderating effect for the self-efficacy of the adolescent has been found in the current study, although moderation effects for self-efficacy of the adolescent were found for several relations between parental behaviors and substance use of the adolescents in previous research (Golestan & Abdullah, 2015; Hedzir et al., 2019).

An explanation for the different findings can be found in the way self-efficacy of the adolescents was measured. In the study of Hedzir et al. (2019), the moderating effect of general self-efficacy on the relation between parental monitoring and the use of substances among adolescents was measured. The general self-efficacy measured in their study was based on the general self-efficacy scale which entails items such as *I am confident that I could deal efficiently with unexpected events; Thanks to my resourcefulness, I know how to handle unforeseen situations; I can remain calm when facing difficulties because I can rely on my coping abilities* (Schwarzer & Jerusalem, 1995). The general self-efficacy as measured in the current study was based on a total of thirteen items. Examples of such items are *I am good at resisting temptations; I have trouble with concentrating; I often do things without thinking about it first* and *I wish I had more self-discipline*. Following this, it can be concluded that the construct of self-efficacy has been measured in two different ways. Also, the items in the current study seem to measure a broader behavioral construct as some of the items are similar to the items used in the Barratt Impulsiveness Scale (Patton et al., 1995). In the Barratt Impulsiveness Scale thirty items have been included such as: *I concentrate easily; I do things*

*without thinking* and *I am self-controlled*. The different constructs of self-efficacy most likely lead to different results and may thus explain the discrepancies found.

Also, in the study of Hedzir et al. (2019) a cross sectional design was used. Therefore, no causal relations between the variables can be established. Furthermore, no conclusions can be made about how this relationship will develop over time.

In the article of Golestan and Abdullah (2015) a smoke related self-efficacy was measured. Thus a behavior specific construct for self-efficacy has been measured whereas in the current study self-efficacy was not related to a specific behavior. However, the self-efficacy of the adolescent is likely to differ between behaviors (Choi et al., 2013; Schunk & Meece, 2006). This implies that the self-efficacy of the adolescent can be strong for one behavior but weak for another behavior. It could thus be strong for one substance related behavior such as smoking, but weak for another substance related behavior such as cannabis use (Carpenter & Howard, 2009; Choi et al., 2013; Musher-Eizenman et al., 2003). It is therefore questionable if a general self-efficacy can be measured. This could also explain why no effects for a general self-efficacy have been found.

Moreover, in the studies of Golestan and Abdullah (2015) and Hedzir et al. (2019), the samples existed of Iranian and Malaysian adolescents. It might therefore be that the results found in the two studies are not representative for adolescents in other countries like the Netherlands.

### **Limitations and Future Directions**

Despite the use of a longitudinal design, the innovativeness of the study and the extensive use of existing literature, several limitations can be found for the current study. First, it is likely that parental worries have an indirect effect on the substance related behavior of the adolescent through (in)effective parenting practices. Unfortunately, parenting practices such as parental monitoring have not been included in the current research. Future research

should therefore have a closer look at the influence of effective and ineffective parenting practices on the monthly prevalence of cannabis use by the adolescent. Second, the data that has been used in the current study consists of self-reports of both adolescents and parents. Self-reports could lead to biased results due to the risk of socially desirable answers. However, even though there is a risk for socially desirable answers, evidence has been found that self-reports are a reliable method to measure the use of substances (Barnea et al., 1987; Del Boca & Darkes, 2003; Koning et al., 2010; Ramo et al., 2012) and often applied in larger sample studies. Third, a limitation is that the dependent variable for monthly prevalence of cannabis use has been dichotomized due to the skewed distribution of the variable (0= never used cannabis, 1= used cannabis once or more). Adolescents who only used cannabis once in the last month are placed in the same category as adolescents who used cannabis 40 times or more in the last month. In this way the variety of cannabis behaviors of adolescents have been taken together in one category, even though it is a big difference if an adolescent used cannabis once or 40 times in the last month. In this way there is less variance to explain. Nevertheless, the use of cannabis at an early age continues to have a major impact on the use of cannabis later in life (Bogenschneider et al., 1998; Booth & Anthony, 2014). Fourth, it is questionable if the thirteen items for self-efficacy also measured the self-efficacy of the adolescent or possibly a broader construct. This may have led to biased results in the current study. Finally, the current study focused on the monthly prevalence of cannabis use among younger adolescents. However, the prevalence of cannabis is low among younger adolescence (Van Dorsselaer, Tuithof, Verdurmen, et al., 2016). Future studies should have a closer look on the influence of parental worries on the cannabis use for older adolescents, when the prevalence of cannabis is higher.

### **Conclusions and Implications**

The present study looked at the influence of parental worries on the monthly prevalence of cannabis use of the adolescent and whether this is possibly moderated by the self-efficacy of the adolescent. No effects were found for parental worries on the monthly prevalence of cannabis use by the adolescent. Also, no moderating effects for the self-efficacy of the adolescent were found. The results imply that parental worries do not influence the monthly prevalence of cannabis use by the adolescent. However, due to the small sample of adolescents who use cannabis, it cannot be concluded that parental worries do not have an effect at all. More research should be conducted about the effects of parental worries on the cannabis use of the adolescent.

Multiple implications can be found for the current study. As the target group in this study was rather young, it would be interesting to investigate the role of parental worries among older adolescents, when the prevalence rate of cannabis use of adolescents is higher. Also, as other research found that the self-efficacy of the adolescent is domain specific, it would be very valuable to learn more about the role of self-efficacy for specific substances, i.e. cannabis specific self-efficacy. In this way a complete picture of the influence of self-efficacy of the adolescent would be obtained. This could play an important role in intervention and prevention programs for the use of substances among younger and older adolescents.

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### **Appendix A: Interdisciplinary Approach**

In the current study the relationship between parental worries and adolescent cannabis use will be examined. Also, there will be looked at to which extent this relationship is moderated by the self-efficacy of the adolescent.

The use of cannabis is associated with several psychological and physical problems such as lower educational attainment, psychotic disorders and dependency (Hall, 2014). Also, adolescents who use cannabis have a higher change of using other illicit drugs as well (Hall, 2014; Kandel, 1975; Mayet et al., 2012). Several factors are related to the cannabis use of the adolescent. These factors can be categorized in different levels of influence, which are described in Bronfenbrenner's ecological model. The model of Bronfenbrenner emphasizes that behavior both shapes and is shaped by multiple levels of influence (Bronfenbrenner, 1977). These levels are divided in the individual level, the microsystem level, the mesosystem level, the exosystem level and the macrosystem level (Bronfenbrenner, 1977).

At the individual level self-efficacy has an influence on the cannabis use of the adolescent. Adolescents who perceive themselves as capable of performing a socially valued behavior are less likely to become involved in risk behaviors such as the use of cannabis and are more likely to make behavioral decisions that have positive outcomes (Halpern-Felsher et al., 2004; Ludwig & Pittman, 1999). On the microsystem level, it has been found that negative attitudes from parents towards the use of cannabis influences the attitude of the adolescent about the use of cannabis (Defoe, 2016). Parenting behaviors, which can be seen on the mesosystem level, also influence the cannabis use of adolescents (Chen et al., 2005; Krohn et al., 2018; Vermeulen-Smit et al., 2014). Parental rule setting for the use of cannabis for example predicts a lower prevalence of cannabis use (Looze et al., 2012). On the exosystem, neighborhoods have an influence on the cannabis use of the adolescent (Fuentes et al., 2015). Adolescent who live in high-risk neighborhoods use more cannabis than adolescent

who live in low-risk neighborhoods (Fuentes et al., 2015). Furthermore, research showed that drug policies are associated with drug use among adolescents, such as the use of cannabis (Engbersen & Veen, 1992). A drug policy does not always have the intended effect and can even lead to more drug use among adolescents (Engbersen & Veen, 1992). These drug policies can be seen on the macrosystem level.

In the current study parental worries can be seen on the mesosystem level whereas the self-efficacy of the adolescent and the cannabis use of the adolescent can be seen on the individual level. The relation is thus looked at from different perspectives and it can therefore be concluded that this study has an interdisciplinary approach.

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**Appendix B: Contract data use (TED)**

Utrecht, 2019

This letter constitutes formal confirmation of the fact that the data from the Utrecht University Youth Studies 2019 have been made available to Lieke Baars of Utrecht University.

These data will not be made available to others, and the data may be used only for analysis and reporting on topics for the thesis, about which agreement has been reached with Ina Koning.

Lieke Baars will receive access to the data from the dataset in order to answer the following research questions within the framework of the thesis: *What is the effect of parental worries on the cannabis use of adolescents and how is this influenced by the self-efficacy of the adolescent?*

The following variables will be used:

Dependent variable: Monthly prevalence of cannabis use of the adolescent (Question 23, adolescent questionnaire).

Independent variables: Parental worries (Question 22, parent questionnaire).

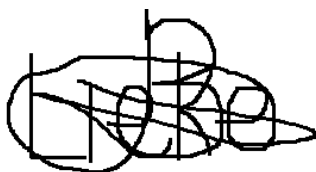
Other variables: Self-efficacy of the adolescent (Question 33, adolescent questionnaire), age of the adolescent (Question 1, adolescent questionnaire), gender of the adolescent (Question 2, adolescent questionnaire), education of the mother and the father (Question 5, parent questionnaire).

No report based on the data from the project entitled 'Prevention Alcohol Use in School Children' may be made public, unless permission has been obtained in advance from the Project Coordinator for the 'Prevention Alcohol Use in School Children'.

After the expiration of this contract, dated 12-06-2020 Lieke Baars shall delete the 'Prevention Alcohol Use in School Children' data.

Dates and signature:

28-01-2020

A handwritten signature in black ink, appearing to read 'LIEKE BAARS', written over a faint grid background.

Name of student: Lieke Baars

Name of Project Coordinator: Ina Koning

### Appendix C: Syntax

\*Only the control group will be analyzed to make sure the results are not influenced by the effects of the intervention\*

```
DATASET ACTIVATE DataSet1.
```

```
USE ALL.
```

```
COMPUTE filter_$=(CONDITIE = 4).
```

```
VARIABLE LABELS filter_$ 'CONDITIE = 4 (FILTER)'.  
VALUE LABELS filter_$ 0 'Not Selected' 1 'Selected'.  
FORMATS filter_$ (f1.0).  
FILTER BY filter_$.  
EXECUTE.
```

```
DESCRIPTIVES CONDITIE.
```

\* The needed variables will be computed or recoded for the analysis.\*

\*First the control variables for education of the father, education of the mother, gender of the parent, gender of the adolescent and the cannabis use of the adolescent at T1 will be recoded. Also the variable for age of the adolescent will be computed.\*

```
RECODE zv2 (1=0) (2=1) INTO gender_ad.
```

```
VALUE LABELS gender_ad 0 'jongen' 1 'meisje' .
```

```
RECODE cv2 (1=0) (2=1) INTO gender_pa.
```

```
VALUE LABELS gender_pa 0 'man' 1 'vrouw' .
```

```
RECODE dn5a (1 THRU 3 = 1) (4=2) (5 thru 7 = 3) INTO educ_mot.
```

```
VALUE LABELS educ_mot 1 'laagopgeleid' 2 'middelbaaropgeleid' 3 'hoogopgeleid'.
```

```
RECODE dn5b (1 THRU 3 = 1) (4=2) (5 thru 7 = 3) INTO educ_fat.
```

```
VALUE LABELS educ_fat 1 'laagopgeleid' 2 'middelbaaropgeleid' 3 'hoogopgeleid'.
```

```
RECODE zv23c (0=0) (1 THRU 13 = 1) INTO cannabisuse1.  
VALUE LABELS cannabisuse1 0 'never used' 1 'used once or more'.
```

```
COMPUTE age_t1=DATE.DMY(07,03,2008) - zv1.
```

```
COMPUTE age_t1_1=age_t1 / (365.25*24*60*60).
```

```
DESCRIPTIVES gender_ad gender_pa educ_mot educ_fat cannabisuse1 age_t1_1.  
FREQUENCIES gender_ad gender_pa educ_mot educ_fat cannabisuse1 age_t1_1.
```

\*The dependent variable for the cannabis use of the adolescent at T2.\*

```
RECODE wv23c (0=0) (1 THRU 13 = 1) INTO cannabisuse2.  
VALUE LABELS cannabisuse2 0 'never used' 1 'used once or more'.
```

```
DESCRIPTIVES cannabisuse2.  
FREQUENCIES cannabisuse2.
```

\* Reliability test for the parental worries scale.\*

#### RELIABILITY

```
/VARIABLES=cv22a cv22b cv22c cv22d cv22e  
/SCALE('Parental worries scale') ALL  
/MODEL=ALPHA  
/STATISTICS=DESCRIPTIVE SCALE CORR  
/SUMMARY=TOTAL MEANS CORR.
```

\* Creating a mean score for the independent variable parental worries with a higher score indicating more parental worries \*.

```
DESCRIPTIVES cv22a cv22b cv22c cv22d cv22e.  
FREQUENCIES cv22a cv22b cv22c cv22d cv22e.
```

COMPUTE meanworries1=MEAN.3 (cv22a,cv22b,cv22c,cv22d,cv22e).

DESCRIPTIVES meanworries1.

FREQUENCIES meanworries1.

\* Recoding variables for the variable self-efficacy of the adolescent to make sure all the variables are in the same direction\*

DESCRIPTIVES zv33a zv33b zv33e zv33f zv33g zv33h zv33i zv33k zv33l.

FREQUENCIES zv33a zv33b zv33e zv33f zv33g zv33h zv33i zv33k zv33l.

RECODE zv33a zv33b zv33e zv33f zv33g zv33h zv33i zv33k zv33l (1=5) (2=4) (3=3) (4=2) (5=1) INTO rzv33a rzv33b rzv33e rzv33f rzv33g rzv33h rzv33i rzv33k rzv33l.

\* Reliability test for the self-efficacy scale.\*

RELIABILITY

/VARIABLES=rzv33a rzv33b rzv33e rzv33f rzv33g rzv33h rzv33i rzv33k rzv33l zv33c  
zv33d zv33j zv33m

/SCALE('self-efficacy scale') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE CORR

/SUMMARY=TOTAL MEANS CORR.

\* Mean score for self-efficacy with a higher score indicating a higher self-efficacy\*.

COMPUTE meanself1=MEAN.3

(zv33c,zv33d,zv33j,zv33m,rzv33a,rzv33b,rzv33e,rzv33f,rzv33g,rzv33h,rzv33i,rzv33k,rzv33l)

DESCRIPTIVES meanself1.

FREQUENCIES meanself1.

\* Computing the interaction effect\*

```
DESCRIPTIVES VARIABLES=meanself1 meanworries1
```

```
/SAVE
```

```
/STATISTICS=MEAN STDDEV MIN MAX.
```

```
COMPUTE worries_selfefficacy = Zmeanworries1 * Zmeanself1.
```

```
COUNT cmiss = educ_mot educ_fat cv2 cv22a cv22b cv22c cv22d cv22e dv22a dv22b  
dv22c dv22d dv22e (MISSING).
```

```
FREQUENCIES VARIABLES=cmiss
```

```
/ORDER= ANALYSIS.
```

```
COUNT cmiss2 = zv2 wv2 zv33a zv33b zv33c zv33d zv33e zv33f zv33g zv33h zv33i zv33j  
zv33k zv33l
```

```
wv33a wv33b wv33c wv33d wv33e wv33f wv33g wv33h wv33i wv33k wv33l (MISSING).
```

```
FREQUENCIES VARIABLES=cmiss2
```

```
/ORDER= ANALYSIS.
```

\* To see if there are difference between the non-participating and the participating adolescents at T2 an attrition analysis will be executed\*.

```
RECODE wv23c (MISSING=0) (ELSE=1) INTO cannabis_attrition.
```

```
VARIABLE LABELS cannabis_attrition 'cannabis_attrition'.
```

```
List cannabis_attrition wv23c.
```

```
T-TEST GROUPS=cannabis_attrition(0 1)
```

```
/MISSING=ANALYSIS
```

```
/VARIABLES=gender_ad
```

```
/CRITERIA=CI(.95).
```

```
T-TEST GROUPS=cannabis_attrition(0 1)
```

```
/MISSING=ANALYSIS
```

```
/VARIABLES=age_t1_1
```

```
/CRITERIA=CI(.95).
```

```
T-TEST GROUPS=cannabis_attrition(0 1)
```

```
/MISSING=ANALYSIS
```

```
/VARIABLES=meanself1
```

```
/CRITERIA=CI(.95).
```

```
T-TEST GROUPS=cannabis_attrition(0 1)
```

```
/MISSING=ANALYSIS
```

```
/VARIABLES=zv23c
```

```
/CRITERIA=CI(.95).
```

\* An attrition analysis will also be conducted for parents to see if there are differences between the participating and the non-participating parents at T2\*

```
RECODE dn5a (MISSING=0) (ELSE=1) INTO opleiding_attrition.
```

```
LIST dn5a opleiding_attrition.
```

```
T-TEST GROUPS=opleiding_attrition(0 1)
```

```
/MISSING=ANALYSIS
```

```
/VARIABLES=meanworries1
```

```
/CRITERIA=CI(.95).
```

```
T-TEST GROUPS=opleiding_attrition(0 1)
```

```
/MISSING=ANALYSIS
```

```
/VARIABLES=gender_pa
```

```
/CRITERIA=CI(.95).
```

\*Deleting the missing cases\*

```
SELECT IF NOT (SYSMIS(cv22a) | SYSMIS(cv22b) | SYSMIS(cv22c) | SYSMIS(cv22d) |
```

```
SYSMIS(cv22e) |
```

```
SYSMIS(dv22a) | SYSMIS(dv22b) | SYSMIS(dv22c) | SYSMIS(dv22d) | SYSMIS(dv22e)
```



```
| SYSMIS(zv23c) | SYSMIS(wv23c) | SYSMIS(zv2) | SYSMIS(cv2) | SYSMIS(educ_fat) |  
SYSMIS(educ_mot)  
OR MISSING(cv22a) | MISSING(cv22b) | MISSING(cv22c) | MISSING(cv22d) |  
MISSING(cv22e) |  
MISSING(dv22a) | MISSING(dv22b) | MISSING(dv22c) | MISSING(dv22d) |  
MISSING(dv22e) | MISSING(zv23c) | MISSING(wv23c)  
| MISSING(zv2) | MISSING(cv2) | MISSING(educ_fat) | MISSING(educ_mot)).
```

\* Descriptive statistics of the adolescent sort by gender of the adolescent \*

```
SORT CASES BY gender_ad.
```

```
SPLIT FILE LAYERED BY gender_ad.
```

```
DESCRIPTIVES age_t1_1 meanself1.
```

```
FREQUENCIES cannabisuse1 cannabisuse2.
```

```
SPLIT FILE OFF.
```

```
DESCRIPTIVES age_t1_1 meanself1.
```

```
FREQUENCIES cannabisuse1 cannabisuse2.
```

\* Descriptive statistics of the parents sort by gender of the parent\*

```
SORT CASES BY gender_pa.
```

```
SPLIT FILE LAYERED BY gender_pa.
```

```
DESCRIPTIVES meanworries1.
```

```
SPLIT FILE OFF.
```

```
DESCRIPTIVES meanworries1.
```

```
FREQUENCIES educ_mot educ_fat.
```

\* To check if the differences in cannabis use between male and female respondents are significant a T-test will be performed.\*

```
T-TEST GROUPS=gender_ad(0 1)
/MISSING=ANALYSIS
/VARIABLES=cannabisuse1
/CRITERIA=CI(.95).
```

```
T-TEST GROUPS=gender_ad(0 1)
/MISSING=ANALYSIS
/VARIABLES=cannabisuse2
/CRITERIA=CI(.95).
```

\* Conducting a spearman correlation to analyze whether the variables in the study correlate \*

NONPAR CORR

```
/VARIABLES=age_t1_1 gender_ad cannabisuse1 educ_mot educ_fat gender_pa
cannabisuse2 meanworries1 meanself1
/PRINT=SPEARMAN TWOTAIL NOSIG
/MISSING=PAIRWISE.
```

\*For the analysis a logistic regression will be conducted\*

```
LOGISTIC REGRESSION VARIABLES cannabisuse2
/METHOD=ENTER gender_ad cannabisuse1
/METHOD=ENTER meanworries1
/METHOD=ENTER meanself1 worries_selfefficacy
/CONTRAST (gender_ad)=Indicator(1)
/PRINT=CI(95)
/CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```

**Appendix D: Igitur scroll form****Information about your thesis**

Please save this form, modify it and e-mail it to your supervisor together with the digital final version of your thesis. For further questions see:

<http://studion.fss.uu.nl/helpdesk/student/scroll>



Student nummer:	5732476
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Master:	Youth Studies

*Begeleider*

Name supervisor/assesor: *	Ina Koning
Name 2th assesor:	Tom ter Bogt

*Scriptie*

Title thesis: *	The effect of parental worries on adolescent cannabis use: Examining the moderating effect of adolescents' self-efficacy.
Language thesis: *	English
Abstract:	It is pretty common for parents to worry about their child now and then. Parents often have problems translating their worries into behavior which hinders parents from acting effectively. This may be relevant for the use of cannabis of the adolescent. Yet, no research is available about the impact of parental worries on the cannabis use of the adolescent. In this study the influence of parental worries on the prevalence of cannabis use of the adolescent will therefore be examined. Additionally, the study examines whether this relationship differs for adolescents with a high or low self-efficacy. The data were derived from the longitudinal <i>Prevention of Alcohol Use in Students</i> (PAS) dataset. A total of 359 parent-child dyads were included. The results of the logistic regression analysis showed no support for the main effects. Parental worries did not have a significant effect on the cannabis use of the adolescent. Furthermore, no interaction effects were found. Following this, it can be concluded that the relationship between parental worries and the prevalence of cannabis use of the adolescents does not differ for adolescents with a high or low self-efficacy.
Key words: (seperated by ;)	Parental worries; cannabis use; self-efficacy; adolescent
Make public: *	Yes
Make public after date:	26-06-2020

Ingevuld op: \* 14-6-20

Door: \* Lieke Baars

\* = Obligated to fill in